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10 Norman Shapiro

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A COMPUTER AND ITS MAN

Norman Shapiro
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For a time during the 60's, I frequently heard humorous anecdotes from people around Cambridge about a computer program, ELIZA, which parodied the behavior of a passive psychotherapist. Although I never had the privilege of interacting with ELIZA, I thought of the program as a rather clever and elaborate but good natured joke about psychotherapy.

Having read a book (Computer Power and Human Reason by Joseph Weizenbaum, W. H. Freeman and Company, San Francisco, 1976), by the program's creator, it is no longer clear to me who the joke was on. Apparently, some people took the program seriously. A number of users of the program attempted to obtain psychotherapy from it, and at least one psychoanalyst heralded it as an existence proof for the feasibility of automatic psychotherapy. Weizenbaum was very disturbed by these reactions, disturbed enough to write this book.

The book's principal avowed purpose is to show that there are certain activities that computers (because they are computers) ought not to be made to engage in and derivatively that there are certain kinds of research that ought not to be done.

In this endeavor, the author has, I think, substantially failed. More specifically, he has not furnished any kind of a structure which one could use to decide what kinds of activities ought not to be engaged in or researched about. Indeed, I would be totally unable to predict with any confidence whatever what activities Weizenbaum would forbid and which he would not forbid.

The only two specific activities (except psychoanalysis) he would forbid to computers do not appear until the last chapter of the book; they are given as examples and are both research activities; his reasons for forbidding them seem to be totally unrelated to the argument of his book.

The first area of research he would forbid is work aimed at the development of speech recognition systems (systems which could convert oral speech to e.g. written form). His "argument" that such research is immoral, as nearly as I can follow it, is

- (1) that speech recognition capability implies natural language understanding,
- (2) that any realization of the capability would involve such expensive computation that only government could afford it,
- (3) that government's use of this technology might well be to monitor all telephone conversations reporting only the "interesting" ones to the government masters.

This argument is so weak, and Weizenbaum's intellect is so strong, that one can only conclude that Weizenbaum has an extremely strong emotional reaction against this work for reasons which are not clear to this reviewer. It is obvious that the real culprit in Weizenbaum's scenario of doom is not speech recognition per se (in fact, much of the speech recognition work

is based on extremely restricted vocabulary and syntax and requires no more natural language understanding capability than does a FORTRAN compiler). No, the real culprit is work toward language understanding, but Weizenbaum makes it clear that this work is not immoral. In fact, he likes it. Furthermore, it is obvious that once one had natural language understanding, speech recognition would be a relatively trivial step.

It is also interesting to me that a society possessing the kind of technology that would make it economically feasible for computers to listen to, to understand, to analyze and make judgments about millions of telephone conversation daily, is so beyond the imagination of any living human being that any moral judgments about how what we might do now would affect such a society are silly.

Weizenbaum dismisses the enormous good such a technology would bestow, (for example, dealing with the medical record problem) without meaningful comment.

Another kind of developmental research which Weizenbaum finds immoral is the coupling of an animal's visual system and brain to computers. He finds this work so immoral that all he can say is that it is disgusting and obscene, and an attack on life itself. That what might be learned in such experimentation might ultimately be used to alleviate human pain and suffering to

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improve the quality and quantity of life, he must realize, but does not mention. Perhaps what he fears most is that man was never meant to possess some knowledge.

Thus the book fails in its avowed purpose. But if instead one views it as an exposition, not about computers and human reason but about Weizenbaum; that is, as a description of the thoughts and feelings about computers of one who has thought and felt long and hard, deeply and well about computers, then it is a superb book. It is full of insight, charm, wit (the material on compulsive programming had me crying simultaneously with laughter and sorrow), passion, learning and wisdom.

Weizenbaum uses one tactic which I believe is grossly unfair and misleading. He takes computerniks at their word. That is, he confuses what they say they have done, will do and can do with what they in fact have done, will do, and can do, and actually draws conclusions from the explication of our group fantasies. But Weizenbaum well knows that computerniks as a group, most flagrantly those in artificial intelligence, speak and write in a special code that it is grossly unfair to take literally. In the real world where computers and programs must be sold, grants must be awarded, papers must be refereed, and doctoral theses must be approved, it is hard to see how to control this "inflation of language" in which claims are moving ever faster than achievements. The individual vendor, grant applicant, author and candidate who started to tell the truth would find his words

discounted and his offerings to be thought trivial. Although it is reasonable for Weizenbaum to lament such lack of candor, it is not reasonable for him to draw consequences from literal statements.

One kind of dangerous program that Weizenbaum points to is the very complex program which is in principle undebuggable. By very complex, I mean totally beyond the kin of any one human being. Programs which are very complex in this sense have been common for quite some time. They become dangerous if there are no external, concrete easily agreed upon standards by which their performance might be evaluated, but are used to perform critical tasks. Granted that many programs are too complex to be ever totally bug free, most such programs such as compilers and payroll processors, can be judged by reasonably objective criteria. But what about programs designed to do automatic diagnosis, triage, referral or administer psychotherapy which are generated by heuristic programming, by many people over long periods of time and are too complex for any human being to have any inkling of their operation AND which can be judged only by their past performance in comparison to that of human beings which is itself complex and unreproducible. Weizenbaum fears with legitimacy that "bugs" in such a program could be very dangerous. Perhaps the same might be said of human beings who are given such awesome responsibility.

Whatever else can be said of this book, I guarantee that reading it will be an experience not soon to be forgotten, that reaction to it will be intense.